

D. Materials Warranty

General Provisions 101 through 150.

853.2.09 Dowel (Tie) Bars**A. Requirements**

Use uncoated, plain or deformed billet-steel bars that meet the requirements of ASTM A 615/ M, Grade 40 (300) for dowel bars or tie bars in curbs, concrete medians, and other areas specified on the Plans.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

The Department will accept the steel based on the results of the tests made by the Department or on the certification of the manufacturer.

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General Provisions 101 through 150.

Section 854—Castings and Forgings

854.1 General Description

This section includes the requirements for the following castings and forgings:

- Gray iron drainage castings
- Cast aluminum alloy railing posts
- Aluminum alloy sand mold castings
- Steel castings
- Steel forgings
- Cold-finished carbon shafting
- Steel castings for bridges

854.1.01 Related References**A. Standard Specifications**

Section 501—Steel Structures

B. Referenced Documents

AASHTO	ASTM
M 102/ M 102M	ASTM A 27/ A 27M
M 169	ASTM B 26/ B 26 M, Alloy UNS A03560
M 306	ASTM B 108

QPL 11

ANSI 356 Temper T 6

854.2 Materials**854.2.01 Gray Iron Drainage Castings****A. Requirements**

Each foundry shall conform to Standard Operating Procedure 18 (SOP 18), “Inspection of Gray Iron Drainage Castings”.

854.2.02

1. Type

Use gray iron drainage castings that meet the requirements of AASHTO M 306, Class 35B. Proof load testing as described in AASHTO M 306, Section 7, will not be required.

Use foundries listed on QPL 11.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

The Department will accept the castings based on the following:

- Quality of work and conformance to dimension and shape requirements
- Transverse or tension bar test results

D. Materials Warranty

General Provisions 101 through 150.

854.2.02 Cast Aluminum Alloy Railing Posts

A. Requirements

1. Type

Use permanent mold types of cast-aluminum alloy roadway railing post that meet ASTM B 108 requirements.

Ensure that the finish on the castings meets the specifications on the Plans.

2. Certification

Submit a report with each shipment of castings that includes test results and certifies compliance with this Specification.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

The Department will accept the castings based on the following:

- Quality of work and conformance to dimension and shape requirements
- Certification that the physical and chemical properties of the material meet these Specifications

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General Provisions 101 through 150.

854.2.03 Aluminum Alloy Sand Mold Castings

A. Requirements

1. Type

Use aluminum base alloy and castings that meet the requirements of ASTM B 26/ B 26M, Alloy UNS A03560 or ANSI 356 Temper T 6.

2. Certification

Submit a report with each shipment of castings that includes test results and certifies compliance with this Specification.

B. Fabrication

Sandblast or otherwise clean the scale and sand off the castings to produce a smooth and uniform surface.

C. Acceptance

The Department will accept the castings based on the following:

- Quality of work and conformance to the dimension and shape requirements, as inspected when received
- Certification that the physical and chemical properties of the material meet these Specifications

D. Materials Warranty

General Provisions 101 through 150.

854.2.04 Steel Castings**A. Requirements**

1. Type
Use carbon steel castings that meet the requirements of ASTM A 27/ A 27M, Grade 65-35 (450-240). Ensure that the form and dimensions of the steel castings are true to pattern.
2. Certification
Submit a report with each castings shipment that includes test results and certifies compliance with this Specification.

B. Fabrication

1. If the Plans require large castings, suspend and hammer them all over. Ensure that no cracks, flaws, or other defects appear after this treatment. The Department will not accept sharp unfilleted angles or corners.
2. Coat surfaces marked "Finished" as soon as practical after finishing with a corrosion-resistant grease before removing them from the shop.
3. Apply a shop coat of paint to casting surfaces milled for removing scale, scabs, fins, blisters, or other surface deformations. Ensure that the shop coat of paint meets the requirements of Subsection 501.3.04.D.10, "Shop Painting."

C. Acceptance

The Department will accept the castings based on the following:

- Quality of work and conformance to the dimension and shape requirements, as inspected when received
- Certification that the physical and chemical properties of the material meet these Specifications

D. Materials Warranty

General Provisions 101 through 150.

854.2.05 Steel Forgings**A. Requirements**

1. Type
Use steel forgings that meet the requirements of AASHTO M 102/M 102M for the class shown on the Plans.
2. Certifications
 - a. Submit a record to the Engineer of the annealing charges that show the forgings in each charge, the melt or melts from which they were secured, and the treatment they received.
 - b. Submit a report with each castings shipment that includes test results and certifies compliance with this Specification.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

The Department will accept the castings based on the following:

1. Quality of work and conformance to the dimension and shape requirements, as inspected when received
2. Certification that the physical and chemical properties of the material meet these Specifications

D. Materials Warranty

General Provisions 101 through 150.

854.2.06 Cold-finished Carbon Shafting**A. Requirements**

1. Type
Use cold-finished carbon steel bars that meet the requirements of AASHTO M 169 for the grade shown on Plans.

854.2.07

2. Certification

Submit a certification to the Engineer that shows the chemical properties of the material and conformance to the Specifications.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

The Department will accept the material based on favorable review of the certification.

D. Materials Warranty

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854.2.07 Steel Castings for Bridges

A. Requirements

1. Type

Use steel castings for bridge components that meet the requirements of ASTM A 27/ A 27M for the class shown on the Plans.

2. Certification

Submit a certification to the Engineer that shows the physical and chemical properties of the material and conformance to the Specifications.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

The Department will accept the material based on favorable review of the certification.

D. Materials Warranty

General Provisions 101 through 150.

Section 855—Steel Pile

855.1 General Description

This section includes the requirements for the following types of steel pile:

- Welded and seamless steel pile
- Fluted steel shell pile
- Steel H-pile

855.1.01 Related References

A. Standard Specifications

General Provisions 101 through 150.

B. Referenced Documents

ASTM A 27/ A 27M

ASTM A 252

ASTM A 709/ A 709M

QPL 37

QPL 44